AMENDMENTS TO THE DRAWINGS

Proposed Changes to Fig 6 attached

REMARKS

Claims 1-10, all the claims pending in the application, stand rejected. Applicants have amended claims 1-4 and 8.

Drawings

The Examiner has objected to the drawings under 37 C.F.R. § 1.83(a), since they do not show every feature of the invention specified in the claims, specifically, the expansion/contaction sensor of claim 4 and the vibration sensor of claim 8.

A proposed drawing amendment to Fig. 6 that would add schematic representations of these structures is attached for the Examiner's review and approval. No new matter would be added. Appropriate comment in the specification has been added.

Claim Rejections - 35 U.S.C. § 102

Claims 1-4, 9 and 10 are rejected under 35 U.S.C. § 102(e) as being anticipated by Cleland et al (U.S. 2003/0030299). This rejection is traversed for at least the following reasons.

The Invention

The subject matter of the present invention is disclosed in accordance with embodiments as illustrated in Figs. 1-8, particularly Fig. 6. The invention concerns a **door-opening/closing apparatus** for a vehicle. In this regard, Applicants note that the introductory portion of the claim is directed to the "apparatus," but the body of the claim includes structures relating to the vehicle. Thus, Applicants have amended the claim to place the vehicle-related structures in the preamble of the claim. The remainder of the claim would be directed to the components illustrated in Fig. 6 or their specific implementation in enabling closure of a door only when a user intends to close the door;

Fig. 6 illustrates a control unit 6 which is coupled to a door switch 3, position detection switch 4 and electrostatic switch 5 to detect conditions related to an automatic door opening/closing function. These components serve as inputs to the control unit 6, which processes these inputs and provides control signals to a door opening/closing apparatus 7 and/or a closer 8. The inputs are related to a detection of two conditions, (1) whether there is a

movement of the door and (2) whether the door is attempted to be closed. On the basis of the condition that a movement is detected by a door movement detection unit and an attempt to close the door (as intended by a user) is judged by a judgment unit, the driving unit is operated to close the door.

The door-opening/closing apparatus 7 is mounted between a body 1 of the vehicle and a door 2 that closes an opening 1A formed in the body 1, and the door-opening/closing apparatus 7 opens and closes the door 2 (page 3, lines 16-22).

As explained beginning at page 6, line 19, a judgment as to whether an **attempt is made to close the door** can be determined by a variety of sensors such as the door switch 3, which may be a driver switch, open handle switch, a keyless switch or a gate switch. In one example explained at lines 22-24 of page 6, the door switch switches between a closing command and an opening command depending on the length of ON time of the switch. Judgment as to whether an attempt is made to close the door may also be made by electrostatic switch 5. All of these switches are adapted to judge an intentional closing of the door.

Actual **movement of the door** may be determined by a position detection switch 4, as explained at page 7, lines 9-22, specifically at lines 20-22.

In operation, as explained beginning at page 8, line 9, particularly at page 9, line 12, with regard to a closing command, the process illustrated in Fig. 8 and explained at page 10, lines 14-page 11, line 9, would be followed. Specifically, if the door moves in a closing direction, the control unit 6 starts counting the number of pulses input from the position detector switch 4. If a predetermined number of pulses is input to the control unit 6 (S1), the control unit checks whether the electrostatic switch 5 is in an ON state (step S2). The electrostatic switch would be in the ON state where a portion of the door 2 is pushed and the control unit judges that the door is **attempted to be closed** by the user. Then the door-opening/closing apparatus 7 operates to close the door in step S3. However, if the door 2 moves in the closing direction by some force, the door 2 does not close by itself unless the user touches the electrostatic switch 5, indicating an acceptable **attempt to close the door**. As explained, this prevents inadvertent operation, as by a child.

As explained at pages 11-12, the switch 5 also may be a temperature sensor, electrostatic switch or vibration sensor. In the latter case, where there is vibration, it may be determined that there can be no attempt to close the door by a user. This way, the door may not be closed arbitrarily or accidentally against a user's will or in unsafe conditions. The closure must be intentional.

These features are reflected in the claims. Moreover, the claims indicate that the door movement detection unit may detect a rotation of a hinge (claim 3) or the expansion and contraction of a damper (claim 4). Further, the judgment unit may be coupled to a touch sensing unit (claim 5), electrostatic switch (claim 6) or temperature sensor switch (claim 7).

Cleland et al

The publication to Cleland et al discloses a body having an opening 14, a door 18 for closing the opening and a driving unit 32 that drives the door 18 to close the opening 14, as illustrated in Figs. 1-9 and 23. The Examiner asserts that the operation of the door would be controlled by a system as illustrated in Fig. 15, which comprises a microprocessor 502, a plurality of sensors 206, 506, 508, 510 and a drive unit 534. A user input 512 is also coupled to the microprocessor. As explained at paragraphs [0125]-[0127], the user input may be in the form of one or more panels 514 that have control buttons for opening, closing and stopping the door.

In his analysis, the Examiner asserts that the claim **door movement detection unit** is identified by the reference number 500. However, this number relates to the entire system, as explained at paragraphs [0110]-[0127]. Thus, it cannot be such unit.

In reply, the Examiner may assert that the microprocessor 502 is the door movement detection unit. However, the Examiner already has asserted that the microprocessor is the judgment unit. Applicant respectfully submits that this unit cannot be both. Moreover, based on Applicant's claim amendment, Applicant has specified a motor control unit that receives two inputs and controls operation of the drive motor, as is consistent with the Applicant's disclosure. The microprocessor 502 in Cleland et al is not anticipatory as it does not have the two claimed inputs, a detector input and a judgment input.

As explained at paragraph [0111], the microprocessor 502 of Cleland et al is constructed and adapted to control the speed and direction of the drive motor 534. The microprocessor may also control the stop structure 204 and strut assembly 28 for several purposes, including to stop movement of the door 18, to effect a change in the rate of movement of the door 18 or to selectively execute portions of the movement sequence of the strut assembly 28. As explained at paragraph [0112], the microprocessor 502 is also configured to compensate for external or environmental conditions which may affect the performance of the assembly, including external temperature and tilt angle of the vehicle. The patent explains at paragraph [0113], that the input from any of the sensors 206, 506, 508 or 510 allows the microprocessor to alter the performance of the system 500 in accordance with the conditions to which the automobile 10 is subjected. A particular feature of each sensor are explained at paragraphs [0114]-[0115]. As noted by the Examiner in his rejection, the door position sensor 506 can be an angle encoder associated with a hinge assembly.

The Examiner further notes that Cleland discloses at paragraph [0130] a detection of the expansion and contraction of the damper mounted between the body and the door. However, this particular disclosure concerns an alternative to the rotary angular position encoder where the rotary sensor could be assembled into a "pincher", "close pin", or "scissor"-type subassembly. There is no teaching or suggestion that such structure would be a damper.

Finally, the Examiner notes that there is a teaching in Cleland that the door (18) may be a backdoor (Fig. 1) or a side door paragraph [0046] that closes a side gate on the body of a vehicle.

In response to this rejection, Applicant first notes that claim 1 has been amended to specify a motor control unit that receives the output of (1) a door movement detection unit and (2) a door closure judgment unit, and is responsive by operating the motor control unit. In other words, the claimed door opening/closing apparatus requires two inputs, one from a unit that judges whether the door is (intentionally) attempted to be closed and a second where the movement of the door is detected.

Applicant respectfully submits that none of the sensors identified in Cleland are directed to the detection of the movement of the door so that an automatic closure may result. As

explained in the foregoing cited paragraphs, particularly at paragraph [0123], the inputs from the sensors allow the microprocessor to determine whether the lift gate control system 500 and strut assembly 28 are performing optimally and to compensate for changes in performance. Movement of the door is not detected by detecting a rotation angle in the disclosure of paragraph [0017]. As explained at paragraph [0128], the sensing and monitoring is performed to determine the position of the door so that the angular position of the door 18 relative to the door frame 14 may be measured. There is no teaching or suggestion that the sensor may be employed to detect movement of the door so that an automatic closure may result.

The discussion at paragraph [0130] does teach that as a door 18 moves, a rotary sensor generates an output signal as a function of the angular movement and directs that signal to the control unit to control the movement of the door 18. (A detailed discussion of the candidate rotary or linear sensors is provided at paragraph [0131]-[0148]. As explained at paragraph [0148], all the sensors detect a dynamic property (e.g., position, velocity, acceleration, inclination) of the moving lift gate door 18.) However, these teachings are directed to a control of the door once motor drive is initiated, and not to start automated door closure.

Applicant also submits that there is no judgment unit that judges whether the door is attempted to be closed, particularly a unit in the nature of a key, temperature sensor or the like, which serves as an input to a control unit for determining that a door should be closed. This is a sensor of an intended closing of the door.

Cleland is not directed to a door opening-closing apparatus which can close a door only when a user intends to close the door.

Finally, Cleland fails to disclose at least 'a motor control unit that, in response to (1) the movement detection output generated when the door movement detection unit detects a closing movement of the door and (2) the closing attempt output generated when the judgment unit judges that the door is attempted to be closed, controls the driving unit to automatically close the door.

Claim Rejections - 35 U.S.C. § 103

Claims 5-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cleland et al. This rejection is traversed for at least the following reasons.

First, the four claims would be patentable for the reasons already given with regard to claim 1, from which these claims depend.

Second, with regard to claims 5-7, the Examiner admits that Cleland et al does not disclose a sensor that detects human touch as one of the inputs.

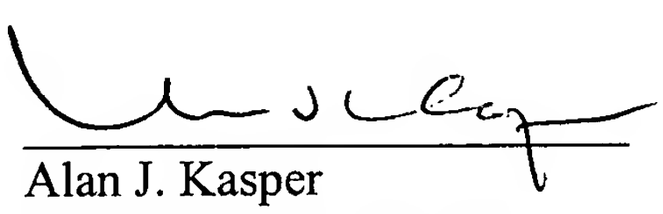
The Examiner further asserts that the touch sensors may be electrostatic and temperature, as recited in claims 6 and 7, respectively. The Examiner asserts that these are well known as methods of beginning the operation of a driving mechanism. This position is not supported by the prior art cited by the Examiner. The Examiner is requested to provide supporting art.

Finally, with regard to claim 8, the Examiner asserts that the door opening/closing apparatus includes a sensor that determines if the vehicle is in motion before opening or closing the door. The Examiner admits that Cleland does not disclose the sensors may be a vibration sensor. However, the Examiner concludes that one of ordinary skill in the art would know to use such sensor to determine whether or not the door should be opened or closed. In this regard, Applicant respectfully requests the Examiner to show such structure in a prior art reference or withdraw the rejection. Even if such reference is found, however, Applicants would still rely upon any distinguishing features set forth with regard to claim 1 as a basis for patentability as well.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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